Chemical/Biological Terrorism
October 2005

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Nation is unprepared for bioterrorism threat, study finds.
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Publication Types: News
PMID: 15719576 [PubMed - indexed for MEDLINE]

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Preparing for bioterrorism at the state level: report of an informal survey.
Hall MJ, Norwood AE, Fullerton CS, Ursano RJ.
Department of Psychiatry, Uniformed Services University of the Health Sciences, Bethesda, Maryland 20814, USA.
Members of 18 states' departments of mental health were interviewed about their plans for managing the psychosocial impacts of a bioterrorism event. Questions were developed from recommendations of an international conference on planning or bioterrorism ("Planning for bioterrorism," 2000). Information derived from consultation to the state's planning process. Familiarity with the unique psychological and behavioral consequences of a bioterrorism event in contrast to natural disasters is essential. Realistic training scenarios that incorporate likely psychosocial impacts and appropriate mental health response must be developed.
PMID: 15792034 [PubMed - indexed for MEDLINE]

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Being prepared: modeling the response to an anthrax attack.
Webb GF.
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Summary for patients in:
Ann Intern Med. 2005 Apr 19;142(8):I40.
Cost-effectiveness of defending against bioterrorism: a comparison of vaccination and antibiotic prophylaxis against anthrax.
Fowler RA, Sanders GD, Bravata DM, Nouri B, Gastwirth JM, Peterson D, Broker AG, Garber AM, Owens DK.
Sunnybrook and Women's College Health Sciences Centre, University of Toronto, Toronto, Ontario, Canada. rob.fowler@sw.ca <rob.fowler@sw.ca>

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BACKGROUND: Weaponized Bacillus anthracis is one of the few biological agents that can cause death and disease in sufficient numbers to devastate an urban setting. OBJECTIVE: To evaluate the cost-effectiveness of strategies for prophylaxis and treatment of an aerosolized B. anthracis bioterror attack. DESIGN: Decision analytic model. DATA SOURCES: We derived probabilities of anthrax exposure, vaccine and treatment characteristics, and their costs and associated clinical outcomes from the medical literature and bioterrorism-preparedness experts. TARGET POPULATION: Persons living and working in a large metropolitan U.S. city. TIME HORIZON: Patient lifetime. PERSPECTIVE: Societal. INTERVENTION: We evaluated 4 postattack strategies: no prophylaxis, vaccination alone, antibiotic prophylaxis alone, or vaccination and antibiotic prophylaxis, as well as preattack vaccination versus no vaccination. OUTCOME MEASURES: Costs, quality-adjusted life-years, life-years, and incremental cost-effectiveness. RESULTS OF BASE-CASE ANALYSIS: If an aerosolized B. anthracis bioweapon attack occurs, postexposure prophylactic vaccination and antibiotic therapy for those potentially exposed is the most effective (0.33 life-year gained per person) and least costly (355 dollars saved per person) strategy, as compared with vaccination alone. At low baseline probabilities of attack and exposure, mass previous vaccination of a metropolitan population is more costly (815 million dollars for a city of 5 million people) and not more effective than no vaccination. RESULTS OF SENSITIVITY ANALYSIS: If prophylactic antibiotics cannot be promptly distributed after exposure, previous vaccination may become cost-effective. LIMITATIONS: The probability of exposure and disease critically depends on the probability and mechanism of bioweapon release. CONCLUSIONS: In the event of an aerosolized B. anthracis bioweapon attack over an unvaccinated metropolitan U.S. population, postattack prophylactic vaccination and antibiotic therapy is the most effective and least expensive strategy.
PMID: 15838066 [PubMed - indexed for MEDLINE]

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Summaries for patients. What is the most cost-effective way to protect people in the event of an anthrax terror attack?
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Cellular bioterrorism: how Brucella corrupts macrophage physiology to promote invasion and proliferation.
Maria-Pilar Jde B, Dudal S, Dornand J, Gross A.
Unidad de Sanidad Animal, Servicio de Investigacion Agroalimentaria, Diputacion General de Aragon, Ap. 727. 50080 Zaragoza, Spain.
Brucellosis is a worldwide human zoonosis caused by intracellular bacteria of the genus Brucella. Virulence factors play an important role in allowing Brucella infection and proliferation within macrophages. Brucella enters macrophages through lipid raft microdomains, avoids phagolysosome fusion, and inhibits TNF-alpha secretion and apoptosis. Furthermore, Brucella can perturb bactericidal activity in macrophages by influencing the host cell response to its advantage through its LPS or by activating the cAMP/PKA pathway. To date, small steps have been taken in defining and understanding the virulence factors of Brucella used in macrophage subversion, but further investigation is required to fully explain virulence and persistence.

Publication Types: Review Review, Tutorial
PMID: 15721833 [PubMed - indexed for MEDLINE]

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Worries over bioterrorism push.
Dixon B.
Publication Types: News
PMID: 15864848 [PubMed - in process]

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Bioterrorism, Glanders and melioidosis.
Cheng AC, Dance DA, Currie BJ.
Menzies School of Health Research, Charles Darwin University, Darwin, Australia. Geelong Hospital, Barwon Health, Geelong, Australia.
We note with interest the recently published guidelines for management of melioidosis and glanders. We are clinicians with extensive experience with melioidosis in Australia and Thailand and would like to express our concern at a number of inaccuracies in these guidelines.
Publication Types: LETTER
PMID: 15827368 [PubMed - as supplied by publisher]

10: Int J Emerg Ment Health. 2005 Winter;7(1):23-31.
Cultural diversity in the integration of disaster mental health and public health: a case study in response to bioterrorism.
Ng AT.
Uniformed Service University of the Health Sciences, USA. atn0623@aol.com
Disaster leads to severe disruptions of the coping capacities of the community. Terrorism, and in particular bioterrorism, has tremendous impact on the community that is affected Cultural groups present unique issues that need to be appreciated for the effective integration of disaster mental health services with public health. The following paper identifies unique issues and challenges of cultural groups in disaster. It highlights issues such as language, cultural interpretation and expression of grief, and help-seeking behavior, as well as inherent cultural resources that can promote resilience. The implications of these cultural issues are illustrated in a potential bioterrorist event, addressing the areas of surge capacity, mass quarantine, and risk communication. Next steps are identified in promoting greater cultural competency in the integration of disaster mental health and public health, thus building greater community resilience.
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Occupational physician perceptions of bioterrorism.
Sterling DA, Clements B, Rebmann T, Shadel BN, Stewart LM, Thomas R, Evans RG.
Division of Environmental and Occupational Health, Institute for Bio-Security, School of Public Health, Saint Louis University, St Louis, MO 63104, USA.
sterling@slu.edu
The rationale for most preparedness training of healthcare professionals is based on the assumption that most persons infected following a biological incident will present first to emergency departments of acute care facilities or to ambulatory settings such as private physician offices, and such incidences would be recognized, appropriately treated, and reported to the local health departments. However, an alternative first point of contact is industry, a location where workers gather and disperse on a regular and documented basis, and require healthcare. In industry there are health professionals responsible for the health, safety and on-site well-being of the workforce and surrounding community; these professionals are in a position for early recognition, surveillance, and isolation. Targeted

education must be provided to these health professionals. To address perceptions of risk and preferred educational delivery methods for bioterrorism and emerging infections-related materials, a survey of occupational physicians was performed during the spring of 2001. Within the 2 months following the September 11 terrorist attack and subsequent anthrax bioterrorism event, and before release of any results from the first survey, a follow-up mail survey was initiated in November 2001. Response rate to the pre-and post-September 11 survey were 58% (n = 56) and 33% (n = 33), respectively. No significant demographic differences were observed between the respondents of the pre- and post-surveys. Perceptions of likelihood of another bioterrorism event increased between surveys, as would be expected; however, a tendency to believe that it would not happen locally persisted. Even though over 90% of the physicians had received immediate training following September 11, additional training/education needs were demonstrated. Although training and education modules can be designed without information based on the population that can be on the receiving end, it rarely accomplishes its goal. Results from this survey can serve as a base for designing various levels of targeted training and educational material specific to the perceived need, method of obtaining information and the format considered to be most conducive for learning. Potential consequences from lack of bioterrorism preparedness due to low perception of need and threat awareness need to be addressed.
PMID: 15881986 [PubMed - in process]

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Pharmacologic prophylaxis against nerve agent poisoning.
Layish I, Krivoy A, Rotman E, Finkelstein A, Tashma Z, Yehezkelli Y.
Chemical, Biological, Nuclear and Radiological Medicine Branch, Medical Corps, Israel Defense Force.
Amitay2@zahav.net.il
Nerve agent poisoning is characterized by the rapid progression of toxic signs, including hypersecretions, tremor, convulsions and profound brain damage. In the political arena of today's world, the threat of nerve agent use against military troops has prompted armies to search for prophylactic protection. The two main strategies for prophylaxis include biological scavengers that can bind or cleave nerve agents before they react with acetylcholinesterase, and antidotes as prophylactic treatment. Pyridostigmine is the current pretreatment for nerve agent poisoning and is in use by most of the armed forces in Western countries. However, since pyridostigmine barely crosses the blood-brain barrier it provides no protection against nerve agent-induced central injury. Pyridostigmine is ineffective when administered without post-exposure treatment adjuncts. Therefore, other directions for prophylactic treatment should be explored. These include combinations of carbamates (reversible AChE inhibitors) and central
anticholinergics or NMDA receptor antagonists, benzodiazepines or partial agonists for benzodiazepine receptor, and other central AChE inhibitors approved for Alzheimer's disease. The transdermal route is an alternative way for delivering the prophylactic agent. Administration of prophylaxis can be extended also for civilian use during wartime.
Publication Types: Review Review, Tutorial
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Bioterrorism defense: are state mandated compulsory vaccination programs an infringement upon a citizen's constitutional rights?
Kohrs B.
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Are you ready for the next outbreak? An exercise in legal preparedness.
Agwunobi JO, Feigenholtz S, Levin DE, Ragland RE.
Florida Department of Health, Tallahassee, USA.

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Bioterrorism and smallpox planning: information and voluntary vaccination.
Selgelid MJ.
Centre for Values, Ethics and the Law in Medicine (D06), and Unit for History and Philosophy of Science (F07), The University of Sydney, NSW, 2006, Australia.
selgelid@med.usyd.edu.au
Although smallpox was declared eradicated in 1980, there are fears that stocks of the virus manufactured for military purposes by the Soviet Union may have fallen into the hands of "rogue nations" or terrorists. Worries about bioterrorism have thus sparked debate about whether or not the smallpox vaccine, which can be dangerous, should be offered to the general public. Meaningful public debate on this issue requires expert information about the likelihood that the virus will in fact be used as a weapon. Informed voluntary individual decision making, about whether to get vaccinated if vaccine is made available to the public, would similarly require appreciation of the likelihood of attack.
Public deliberation and private deliberation thus both require briefing by the intelligence community.
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Preparing for disasters: what should you know, and when should you know it?
DiMaggio C, Markenson D, Redlener I.
Mailman School of Public Health, Columbia University, New York, NY, USA.
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Mickle S.
Kansas Health Institute, USA.
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The ghost of pandemics past.
Mack TM.
Department of Preventive Medicine, Keck School of Medicine at the University of Southern California, Los Angeles, CA 90089, USA. tmack@usc.edu
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Heading-off anthrax at Hamilton, New Jersey: events of October 2001.
Godyn JJ.
UMDNJ-Robert Wood Johnson Medical School, Department of Pathology and Laboratory Medicine, USA.
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Chronic and delayed-onset mustard gas keratitis: report of 48 patients and review of literature.
Javadi MA, Yazdani S, Sajjadi H, Jadidi K, Karimian F, Einollahi B, Ja'farinasab MR, Zare M.
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PURPOSE: To report the clinical features of 93 eyes of 48 patients with chronic and delayed-onset mustard gas keratitis. Clinicopathologic correlation in 5 eyes and a review of related literature are presented. DESIGN: Retrospective, noncomparative case series. PARTICIPANTS: Forty-eight Iranian survivors of Iraqi chemical warfare with chronic or delayed-onset mustard gas keratitis. METHODS: We reviewed the symptoms, clinical findings, course, and treatment of our patients and reviewed the literature. In 5 patients, histopathologic features of corneal and conjunctival specimens were evaluated. MAIN OUTCOME MEASURES: Ocular findings, clinical course, treatment measures, and histopathologic studies. RESULTS: Of 48 patients, 31 (64.6%) had chronic symptomatology, whereas 17 (35.4%) experienced delayed-onset

lesions. Visual acuity at referral ranged from hand motions to 20/20. Ocular surface changes included chronic blepharitis and decreased tear meniscus in all patients, limbal ischemia (81.3%), and
conjunctival vascular abnormalities (50%). Corneal signs in order of frequency were: scar or opacity (87.5%), neovascularization (70.8%), thinning (58.3%), lipoid deposits (52.1%), amyloid deposits (43.8%), and epithelial defects and irregularity (31.3%). Many patients received conservative treatment; others underwent allograft stem cell transplantation (20 eyes of 17 patients), penetrating keratoplasty (12 eyes of 12 patients), and lamellar keratoplasty (4 eyes of 3 patients). Conjunctival specimens were evaluated by light microscopy. Decreased goblet cell density, attenuated or thickened epithelium, scarring in the substantia propria associated with plasmacytic and lymphocytic infiltration, and dilated lymphatic vessels were noted. Excised corneal buttons disclosed absence of epithelium and Bowman's layer, fibrovascular pannus, stromal scarring, and vascularization. CONCLUSIONS: Mustard gas causes chronic and
delayed destructive lesions in the ocular surface and cornea, leading to progressive visual deterioration and ocular irritation. The pathophysiologic features of these changes are not clearly identified. Excised conjunctival and corneal specimens revealed a mixed inflammatory response without any specific features. Based on the clinical appearance of the lesions and the histopathologic findings, an immune-mediated component seems possible. This article contains additional online-only material available at.
Publication Types: Case Reports Review Review, Tutorial
PMID: 15808253 [PubMed - indexed for MEDLINE]

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Demystifying bioterrorism: misinformation and misperceptions.
Noji E, Goodwin T, Hopmeier M.
The true threat of bioterrorism remains mysterious and elusive to the common citizen. It principally has become the dominion of a few "experts", many of whom have limited apparent expertise, who have failed to effectively communicate the risks and realities to society, and have instead created an air of uncertainty surrounding the topic. Unlike the great classic deceptions of modern life (e.g., "the check is in the mail"), the misinformation and misperceptions associated with bioterrorism can be dangerous and are not merely humorous. Indeed, it is possible to grasp the facts as well as fallacies associated with bioterrorism, and, as a result, demystify this nightmare scenario and prepare for the "unthinkable".
Publication Types: Editorial
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Self-assessment in the measurement of public health workforce preparedness for bioterrorism or other public health disasters.
Kerby DS, Brand MW, Johnson DL, Ghouri FS.
Department of Health Promotion Sciences, College of Public Health, University of Oklahoma Health Sciences Center, Oklahoma City, OK 73190, USA.
dave-kerby@ouhsc.edu
OBJECTIVE: The purpose of this study was to examine effective ways to evaluate public health workers' competence for preparedness. METHODS: The Public Health Ready project, developed by the National Association of County and City Public Health Officials and the Centers for Disease Control and Prevention, is a pilot program designed to prepare local public health agencies to respond to emergency events. Workers at a Public Health Ready site (N=265) rated their need for training and their competence in meeting generic emergency response goals. Cluster analysis of cases was conducted on the self-assessed need for training. RESULTS: Three groups of workers emerged, differing in their overall ratings of need for training. A given worker tended to report similar needs for training across all training goals. CONCLUSIONS: In this study, workers' ratings of need for training may reflect an overall interest in training rather than need for training in a particular area. Caution should be exercised in interpretation

when generic goals and self-assessment are used to measure need for training. Future assessments of training needs may be more effective if they use objective measures of specific local plans.
PMID: 15842121 [PubMed - indexed for MEDLINE]

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Science in Libya. Evidence overruled: medics on death row.
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Bioterrorism and smallpox: policies, practices, and implications for social work.
Mackelprang RW, Mackelprang RD, Thirkill AD.
School of Social Work, Eastern Washington University, Cheney 99004, USA. rmackelprang@mail.ewu.edu
Terrorist acts and the fear of terrorism have become a part of everyday life in the early 21st century. Among the threats most feared is bioterrorism, including the intentional release of smallpox. With the invasion of Iraq and toppling of the Saddam Hussein regime, acute bioterrorism fears have abated; however, an ongoing threat remains.This article addresses the need for knowledge and rational policies in dealing with potential bioterrorism attacks. It presents information on four of the most likely bioterrorism agents: smallpox, anthrax, botulism, and plague. It illustrates the importance of accurate knowledge and rational decision making in addressing the threat of terrorism through the
intentional release of biological weapons such as smallpox. Finally, it provides information essential for social workers to make informed practice decisions, to educate clients and the public, and to advocate for sound public policy.
PMID: 15853189 [PubMed - in process]

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Statistical issues and challenges associated with rapid detection of bio-terrorist attacks.
Fienberg SE, Shmueli G.
Department of Statistics, Center for Automated Learning and Discovery, Carnegie Mellon University, Pittsburgh, PA 15213, USA.
The traditional focus for detecting outbreaks of an epidemic or bio-terrorist attack has been on the collection and analysis of medical and public health data. Although such data are the most direct indicators of symptoms, they tend to be collected, delivered, and analysed days, weeks, and even months after the outbreak. By the time this information reaches decision makers it is often too late to treat the infected population or to react in some other way. In this paper, we explore different sources of data, traditional and non-traditional, that can be used for detecting a bio-terrorist attack in a timely manner. We set our discussion in the context of state-of-the-art syndromic surveillance systems
and we focus on statistical issues and challenges associated with non-traditional data sources and the timely integration of multiple data sources for detection purposes. Copyright 2005 John Wiley & Sons, Ltd.
PMID: 15678405 [PubMed - indexed for MEDLINE]

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Bioterrorism. It was unbelievable.
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Publication Types: News
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Combining SBR systems for chemical and biological treatment: the destruction of the nerve agent VX.
Irvine RL, Haraburda SS, Galbis-Reig C.
University of Notre Dame, Notre Dame, IN 46556, USA.
The US Army is pilot testing the neutralization of VX nerve agent stockpiled at Newport, Indiana using caustic hydrolysis in a Sequencing Batch Reactor (SBR). The resulting hydrolysate was tested at the bench-scale for treatment with activated sludge biodegradation in two distinct studies, one in the SBR and another, in the PACT process. The feed to both biological systems was pretreated to enhance the biodegradability of the hydrolysis products. Both biodegradation studies demonstrated that the hydrolysate could easily meet the Chemical Weapons Convention treaty and US environmental regulations following pretreatment.
PMID: 15656290 [PubMed - indexed for MEDLINE]